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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
MOORE, KARLA A

ART UNIT	PAPER NUMBER
1763	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/887,202	Applicant(s) PRATT ET AL.
	Examiner Karla Moore	Art Unit 1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 and 20-22 is/are rejected.

7)☒ Claim(s) 19 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 16 January 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 and 6 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 1 recites the limitation "the driving magnet array" in line 11. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the limitation was taken as "a driving magnet array".

4. Claim 3 recites the limitation "the first magnet array" in line 1. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the limitation was taken as "the driven magnet array".

5. Claim 4 recites the limitation "the second magnet array" in line 4. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the limitation was taken as "the driving magnet array".

6. Claim 8 recites the limitation "cylinder" in line 1. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the limitation was taken as "the cylindrical tube".

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 22 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,619,572 to Rathmann et al.

8. Rathmann et al. disclose a device for linearly translating a wafer in a semiconductor wafer fabrication system, comprising: means for placing a wafer on a carriage; means for magnetically coupling an actuator to the carriage, the actuator isolated from a vacuum environment; and means for translating the actuator linearly, which in turn translates the carriage, holding the wafer, linearly due to the magnetic coupling (column 10, rows 7-20 and column 10, row 59 through column 11, row 17; see below for detailed description of the device disclosed by Rathmann et al.).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-2 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,619,572 to Rathmann et al. in view of Japanese Patent No. 10-178083 A. to Takada et al. in view of U.S. Patent No. 6,305,895 to Ozawa et al.

11. Rathmann et al. disclose a magnetically coupled linear servo drive mechanism, which is capable of being used in a load lock of a semiconductor fabrication system, substantially as claimed in Figures 1-2 and 9-10. The mechanism comprises: a carriage (Figures 2 and 9, multiple part numbers, 25-26 and 152) for holding a wafer; a driven magnet (166) within the carriage; a guiding mechanism (small rails, column 10, rows 14-16) for guiding the carriage linearly; a cylindrical tube (Figure 10, 159) housing an actuator (multiple part numbers; 160, 164, 165) and isolating the actuator from a wafer environment in the vacuum transport system (17); a driving magnet array (165) inside the cylindrical tube and mounted to an output (nut, 17) of the

linear actuator, the driving magnet array magnetically coupled to the driven magnet mounted within the carriage, the actuator magnetically coupled to the carriage; and an engine (150) coupled to the actuator (column 10, rows 7-20 and column 10, row 59 through column 11, row 17). Rathmann also disclose reactors (Figure 1, 12 and 13) for processing at least one semiconductor wafer.

12. Though, Rathmann et al. do not explicitly disclose driven magnet as a magnetic array (i.e. multiple magnets, rather than a single magnet) the courts have ruled that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F. 2d 669, 124 USPQ 378 (CCPA 1960).

13. With respect to claim 2, while the reactors of Rathmann et al. have are intended to be used for an etching process, they would also be capable of performing CVD (the intended use of the present claimed invention).

14. The courts have ruled a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" of the prior art apparatus teaches all the structural limitations of the claim. Ex Parte Masham, 2 USPQ 2d 1647 (Bd. Pat. App. & Inter. 1987).

15. With respect to claim 7, the guiding mechanism includes a linear ball slide, with the sliders (152) acting as the ball.

16. With respect to claim 8, Rathmann et al. further disclose the cylinder is stainless steel (column 10, rows 61-63), which may be attracted to a magnet, but is not magnetic itself.

17. With respect to claim 9, the shaft is a ball screw shaft, with nut (164) acting as the ball.

18. Rathmann et al. fail to disclose a controller coupled to the engine to control the engine for optimizing transfer times and controlling acceleration.

19. Takada et al. teach the use of a controller (C) coupled to the engine (M) which drives drive means (R) for the purpose of shortening the time required for transfer processing by setting the speed and the transfer acceleration within a range causing no shift of the substrate (W) (abstract and Figure 1).

20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a controller coupled to the engine in Rathmann et al. in order to shorten the time required for transfer processing by setting the speed and the transfer acceleration within a range causing no shift of the substrate as taught by Takada et al.

21. Rathmann et al. further fail to disclose at least one load lock directly coupled to the reactor and housing the magnetically coupled linear servo-drive mechanism to translate wafers to and from the reactor.

22. Ozawa et al. teach the use of a load lock coupled to a reactor and housing a magnetically coupled linear servo-drive mechanism for the purpose of translating wafers to and from the reactor (abstract).

23. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a load lock coupled to a reactor and housing a magnetically coupled linear servo-drive mechanism in the prior art in order to translate wafers to and from the reactor as taught by Ozawa et al.

24. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rathmann et al. and Takada et al. as applied to claims 1-2 and 7-9 above, and further in view of French Patent No. 2766028 A1 to Lemarquand et al.

25. Rathmann et al., Takada et al. and Ozawa et al. disclose the invention substantially as claimed and as described above.

26. With respect to claim 4, Rathmann et al. further disclose the actuator of the mechanism, comprising: a shaft (160) coupled to a pulley system (162), the pulley system coupled to the engine; a nut (164) coupled to the driving magnet array (165), the driving magnet array includes magnets arranged radially, the nut coupled to the shaft such that the nut moves axially along the length of the shaft when the shaft rotates (column 10, rows 7-20 and column 10, row 59 through column 11, row 17).

27. However, Rathmann et al. and Takada et al. fail to teach the driving magnet array or the driven magnet array including at least two permanent magnets having alternating polarities and each of the magnet arrays having the same number of magnets.

28. Lemarquand et al. teach the use of at least two permanent magnets of opposite polarities for the purpose of increasing magnetic mass and hence torque without involving difficult machining of very hard materials. Lemarquand also teach that the invention may be practiced with each of the arrays having the same number (or a different number) of magnets (abstract).

29. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention to have provided driving and driven magnet arrays comprising the same number of permanent magnets of opposite polarities in the prior art in order to increase magnetic mass and hence torque without involving difficult machining of very hard materials as taught by Lemarquand et al.

30. Claims 10, 11, 16-18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,619,572 to Rathmann et al. in view of Japanese Patent No. 10-178083 A. to Takada et al.

31. Rathmann et al. disclose a magnetically coupled linear servo drive mechanism, which is capable of being used in a load lock of a semiconductor fabrication system, substantially as claimed in Figures 1-2 and 9-10. The mechanism comprises: a carriage (Figure 2, 25 and 26); a guiding mechanism (163) for guiding the carriage linearly; a cylinder (Figure 10, 159) housing an actuator (multiple part numbers; 160, 164, 165), the actuator magnetically coupled to the carriage; and an engine (150) coupled to the actuator (column 10, rows 7-20 and column 10, row 59 through column 11, row 17).

32. With respect to claim 11, the carriage includes a radially aligned first magnet (Figure 10, 166).

33. Though, Rathmann et al. do not disclose first magnet as a magnetic array (i.e. multiple magnets, rather than a single magnet) the courts have ruled that the mere duplication of parts

has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F. 2d 669, 124 USPQ 378 (CCPA 1960).

34. With respect to claim 16, Rathmann et al. further disclose two guide shafts (column 10, rows 61-63).

35. With respect to claim 17, Rathmann et al. further disclose the cylinder is stainless steel (column 10, rows 61-63), which may be attracted to a magnet, but is not magnetic itself.

36. With respect to claim 18, the shaft is a ball screw shaft, with nut (164) acting as the ball.

37. However, Rathmann et al. fail to disclose a controller coupled to the engine to control the engine for optimizing transfer times and controlling acceleration.

38. Takada et al. teach the use of a controller (C) coupled to the engine (M) which drives drive means (R) for the purpose of shortening the time required for transfer processing by setting the speed and the transfer acceleration within a range causing no shift of the substrate (W) (abstract and Figure 1).

39. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a controller coupled to the engine in Rathmann et al. in order to shorten the time required for transfer processing by setting the speed and the transfer acceleration within a range causing no shift of the substrate as taught by Takada et al.

40. With respect to claims 20 and 21, similar to the system disclosed above, the combination of Rathmann et al. and Takada et al. also teach a method for linearly translating (using optimized motion) a wafer in a semiconductor fabrication system, comprising: placing a wafer on a carriage; magnetically coupling an actuator to the carriage, the actuator isolated from a vacuum environment; and translating the actuator linearly with controlled acceleration, which in turn translates the carriage, holding the wafer, linearly due to the magnetic coupling.

41. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rathmann et al. and Takada et al. as applied to claims 10,11 16-18 and 20-21 above, and further in view of French Patent No. 2766028 A1 to Lemarquand et al.

42. Rathmann et al. and Takada et al. disclose the invention substantially as claimed and as described above.

43. With respect to claim 13, Rathmann et al. further disclose the actuator of the mechanism, comprising: a shaft (160) coupled to a pulley system (162), the pulley system coupled to the engine; a nut (164) coupled to a second magnet array (165), the second magnet array includes magnets arranged radially, the nut coupled to the shaft such that the nut moves axially along the length of the shaft when the shaft rotates (column 10, rows 7-20 and column 10, row 59 through column 11, row 17).

44. However, Rathmann et al. and Takada et al. fail to teach the first magnet array or the second magnet array including at least two permanent magnets having alternating polarities and each of the magnet arrays having the same number of magnets.

45. Lemarquand et al. teach the use of at least two permanent magnets of opposite polarities for the purpose of increasing magnetic mass and hence torque without involving difficult machining of very hard materials. Lemarquand also teach that the invention may be practiced with each of the arrays having the same number (or a different number) of magnets (abstract).

46. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention to have provided first and second magnet arrays comprising the same number of permanent magnets of opposite polarities in the prior art in order to increase magnetic mass and hence torque without involving difficult machining of very hard materials as taught by Lemarquand et al.

Allowable Subject Matter

41. Claim 19 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

42. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach or fairly suggest a magnetically coupled linear servo-drive mechanism for

use in a load lock of a semiconductor fabrication system as recited in claims 10-13 and further comprising a four-axis gimbal between the nut and the second magnet array.

Conclusion

43. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
January 17, 2003